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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,055	08/16/2001	Simon Dodd	10007744-1	5019

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EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 10/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,055	DODD, SIMON	
	Examiner	Art Unit	
	Lynette T. Umez-Eronini	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 8/16/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-14 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☒ Claim(s) 15-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>1</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-14, drawn to a method of etching, classified in class 216, subclass 27.
 - II. Claims 15-20, drawn to an assembly for conducting liquid, classified in class 347, subclass 59.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another materially different apparatus or by hand, such as one that does not require the passivation layer includes both silicon nitride and silicon carbide.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

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5. During a telephone conversation with Christopher Miller on 9/23/2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action. Claims 15-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

7. A telephone call was made to Robert Sismilich on 9/23/2003 to request an oral election to the above restriction requirement, but did not result in an election being made.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Keefe et al (US 5,635,966).

Keefe teaches, "A PECVD process is next used to deposit **217** a composite silicon nitride/silicon carbide ($\text{SiN}_x/\text{SiC}_y$) layer **117** to serve as component passivation (same as applicant's silicon nitride and silicon carbide) . . . The surface of the structure is masked and etched to create **218** vias for metal interconnects" (column 14, lines 59-62 and **FIG. 11**), which reads on,

masking the portion with passivation material having edges that define boundaries of the surface portion such that within the boundaries the surface portion is exposed for etching;

"A tantalum layer 119 is sputtered onto the surface" (column 14, lines 65 and **FIG. 11**), reads on,

depositing a metal layer over the passivation material;

"Another mask and etch process **221** patterns the gold and tantalum layer to define interconnect traces, the cavitation layer over the heater resistor **70**, reads on,

and then etching the surface portion, **in claim 1**, Since Keefe uses the same steps as those of the claimed invention, then using Keefe's steps in the same manner as that of the claimed invention would inherently result in a method for etching a substrate surface, as claimed in the present invention.

The above aforementioned further read on,

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wherein the masking step includes depositing a layer of silicon nitride on the substrate surface and then depositing on the silicon nitride a layer of silicon carbide, **in claim 2;**

Keefe teaches, "... (PSG) is deposited **212** by PECVD techniques ... and forms the remainder of the thermal inkjet heater resistor **70** oxide underlayer" (column 14, lines 31-34) reads on and **FIG. 11** further shows the step of underlying the passivation material with a layer of phosphosilicate glass at locations near the boundaries of the exposed surface, **in claim 4.**

Keefe teaches, in steps 218 to 222 (**FIG. 12**) depositing, masking, and etching a composite silicon nitride/silicon carbide layer **117**, and metals layers **119** and **120**, which define interconnect traces and cavitation layer over the heater resistor **70** (column 14, lines 59 – column 15, line 5). The said steps describe including the step of fabricating on the substrate drop generator layers. Using Keefe's method in the same manner as the claimed invention would provide for controlled expulsion of liquid from the substrate and read on, wherein the step of covering the passivation material with the metal layer includes the simultaneous deposition of the metal layer at a location away from the exposed surface portion to enable use of some of the metal layer as one of the drop generators layers, **in claim 5.**

10. Claims 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Keefe (US '966).

Keefe teaches, "A mask is then applied and etched to define **216** the resistor heater . . . and conductor traces to the MOSFET gate **108**, source **110** and drain **110'**. A subsequent mask is used similarly to define the heater resistor **70** (the same as applicant's oxide layer in a pattern having edges that define boundaries of the surface portion) . . . A PECVD process is next used to deposit **217** a composite silicon nitride/silicon carbide . . . passivation layer **117**. The surface of the structure is masked and etched to create **218** vias for metal interconnects" (column 14, lines 54-64). The aforementioned reads on,

providing on the substrate surface an oxide layer in a pattern having edges that define boundaries of the surface portion such that within the boundaries the surface portion is exposed for etching; and

covering the oxide layer near the edges with passivation material. Using the steps in the above aforementioned as taught by Keefe in the same manner, as the claimed invention would result in a method of masking a surface of a substrate for controlled etching of a portion of that surface, **in claim 6**.

The above aforementioned further reads on,

including the step of patterning some of the oxide layer to define part of a transistor gate carried by the substrate, **in claim 7**;

including the step of covering the edges of the oxide layer with passivation material, **in claim 8**.

wherein the step of covering the oxide layer with passivation material includes covering the heat transducer with passivation material, **in claim 10**.

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11. Claims 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Keefe (US).

Keefe teaches, "A mask is then applied and etched to define **216** the resistor heater . . . and conductor traces to the MOSFET gate **108**, source **110** and drain **110**'. A subsequent mask is used similarly to define the heater resistor **70** (the same as applicant's oxide layer) . . . A PECVD process is next used to deposit **217** a composite silicon nitride/silicon carbide . . . passivation layer **117**. The surface of the structure is masked and etched to create **218** vias from metal interconnects" (column 14, lines 54-64). Keefe also teaches, in steps 218 to 222 (**FIG. 12**) depositing, masking, and etching a composite silicon nitride/silicon carbide layer **117**, and metals layers **119** and **120**, which define interconnect traces and cavitation layer over the heater resistor **70** (column 14, lines 59 – column 15, line 5). The said steps describe including the step of fabricating on the substrate drop generator layers. Hence, the aforementioned reads on,

providing on the substrate surface a layer to serve both as a drop generator component and as a mask to define the trenches for etching.; and then

etching the trenches, **in claim 11;**

wherein the providing step includes growing a layer of oxide to serve as a transistor gate component of the drop generator as well as the mask, **in claim 12;**

capping the oxide layer near the trench with a layer of passivation material, in **claim 13;** and

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wherein the providing step comprises depositing a layer of passivation material to serve as both a drop generator component and the mask, **in claim 14.**

Allowable Subject Matter

12. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach masking with the passivation material includes the simultaneous deposition of the passivation material at a location away from the exposed surface portion to enable use of some of the passivation material as one of the drop generator layers as well as the mask.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

ltue

September 23, 2003


WILLIAM A. POWELL
PRIMARY EXAMINER